

July 11, 2000

Ms. Sharon Kawahara
Quality Assurance Manager
CCI World Headquarters
22591 Avenida Empresa
Rancho Santa Margarita, CA 92688

Dear Ms. Kawahara,

The United States Nuclear Regulatory Commission (NRC) is reviewing whether certain regulatory requirements for safety-related systems, structures, and components (SSCs) that are of low safety significance could be reduced or eliminated without losing assurance of the component's ability to function under design loadings. Consequently, the NRC, supported by its contractor the Idaho National Engineering & Environmental Laboratory (INEEL), is studying how non-nuclear or nuclear balance-of-plant processes for procuring commercial grade SSCs (as replacements for existing SSCs) and the associated commercial standards assure the functional capability of the component.

To learn the differences in the treatment of nuclear safety systems, nuclear balance-of-plant, and commercial (e.g., fossil power plant) SSCs with regards to practices such as procurement, installation, and maintenance, the NRC/INEEL team believes that it is advisable to gain knowledge from firms (architect-engineers, component vendors, and electric utilities) that have experience with both nuclear and non-nuclear practices. On June 30, 2000, the NRC contacted CCI to see if CCI would be willing to assist the NRC/INEEL team in this information gathering task. The purpose of this letter is to confirm that the NRC/INEEL team will be visiting CCI for a 1-day site visit in Rancho Santa Margarita, CA starting at 8:00 am on Thursday, August 3, 2000. We expect two to three NRC employees and four INEEL staff members will participate in the information gathering visit (i.e., it is not an NRC inspection or audit).

The NRC/INEEL team is knowledgeable in the documents (standards, procedures, etc.) used for nuclear SSCs, but are seeking to identify comparable documents that are used in procuring balance-of-plant or commercial grade SSCs. These may be in the form of document references for commercial industry standards or your company's own internal documents. If the information is contained in your company's documents, we would like to review them while we are at your facility. We will keep all information obtained from your company strictly proprietary.

We expect our visit to last one day. We suggest a brief introductory meeting to discuss the purpose of our visit followed by a brief facility tour. For the remainder of the morning, we would appreciate if a conference room could be made available where we could study any documents provided and have access to your staff knowledgeable on each of the documents on an as-needed basis to answer questions that may arise. In the afternoon, we suggest a meeting with your staff members to go over the general differences in rigor of nuclear and non-nuclear practices. Then we would meet one-on-one with selected individuals to query them in the differences in individual component practices from the general practices. A closeout meeting would conclude the visit.

Ms. Kawahara

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The attached description and tables illustrate the type of information that we hope to gather during our visit to CCI. We realize that all of the items listed may not be applicable to your company and facility.

Thank you for your assistance with this project.

Sincerely,

/ra by/

Eugene V. Imbro, Chief
Mechanical & Civil Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

Attachments: As stated

Ms. Kawahara

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Protocol for Facility Visits

1. Project Background

In SECY-98-300, the NRC staff recommended under Option 2 that risk-informed approaches to the application of special treatment requirements be developed. This option addressed implementing changes to the regulatory scope for systems, structures, and components (SSCs) needing special treatment. Option 2 did not change the design bases for the plant or the design-basis accidents which establish the design conditions for SSCs. SECY-98-300 indicated that safety-related SSCs that are of low safety significance (RISC-3) would move from special treatment to normal industrial (or commercial grade) treatment. They would, however, remain in the plant and be expected to perform their design function, although without the additional margin, assurance, or documentation currently required for safety-related SSCs. In SECY-99-256 the staff indicated that RISC-3 SSCs would receive sufficient regulatory treatment such that the functionality of these SSCs would be maintained albeit at a reduced level of assurance and that this level of assurance may be provided by the licensee's commercial programs.

In order to verify the licensee's commercial programs provide an acceptable level of assurance that components will meet their functional requirements, the NRC staff needs to understand the extent to which normal industrial (or commercial grade) treatments, such as design standards or practices, provide a basis for assuring that a component's or group of components' functional requirements will be satisfied (albeit at a reduced level of assurance than would be provided by having those components subject to the various regulatory special treatment requirements). For example, it is necessary to understand for various types of components, how licensees' processes for procuring commercial grade SSCs and the associated commercial standards assure the functional capability of the component.

The objective of this project is to perform a comparative analysis between the special treatment requirements applied to SSCs in nuclear power plants and commercial requirements applied to SSCs in non-nuclear power plants in an effort to understand the extent to which commercial processes and requirements assure safety-related but low safety significant SSCs will perform their design functions.

As a part of this project several terms have been defined in order to provide a common understanding for the many and varied personnel involved. The following terms and definitions have been established:

- Process: A process is one of several steps needed to be carried out in completing the design, procurement, installation, or operation of an SSC.
- Attributes: The attributes of a process are the requirements that may be needed to complete the process. Each attribute cannot be broken logically into a smaller similar attribute, but may contain more than a single step or requirement.
- Special Treatment Requirements: These are requirements that are listed in federal documents specifically for nuclear power plant SSCs. This scope of this subtask includes the following special treatment requirements (including supporting documentation such as the NRC Standard Review Plan and Regulatory Guides).
- Regulatory Attributes: The regulatory attributes are those requirements of a process that ensure that one or more special treatment requirements are satisfied.

2. Discussion of Project Data

2.1 General

Table 1 has been developed to assist in comparing regulatory attributes required for nuclear safety related systems to non-nuclear practices. Non-nuclear practices include those applied to a nuclear facility's balance-of-plant (BOP) systems as well as to non-nuclear facilities, such as fossil-fueled commercial electrical generating plants. The purpose of Table 1 is to illustrate how the commercial (non-nuclear) industry assures functionality of systems, structures, and components (SSCs) and to identify the differences between processes and requirements typically applied to nuclear and non-nuclear facilities.

Table 1 will be used as a data gathering tool for personnel visiting a nuclear and a non-nuclear utility facility, two vendors, and an architect-engineering (AE) firm. This table will be provided to the facilities being visited prior to the actual visit to allow sufficient time for the facility staff to assemble any information that might be useful to the NRC/INEEL team during the visit. It is recognized that all items in the table will not apply to all facilities and some items will not be answered on every visit.

2.2 Regulatory Special Treatment Processes and Attributes

The Table 1 column "Regulatory Special Treatment Processes and Attributes" identifies regulatory processes and attributes required by the following nuclear industry special treatment rules:

- Environmental Qualification (10 CFR 50.49)
- ASME Codes (10 CFR 50.55a)
- Quality Assurance Program (10 CFR 50 Appendix A Criterion 1, and Appendix B)
- Natural Phenomena (10 CFR 50 Appendix A Criterion 2)
- Environmental and Dynamic Effects (10 CFR 50 Appendix A Criterion 4)
- Inspection of Cooling Water System (10 CFR 50 Appendix A Criterion 45)
- Testing of Cooling Water System (10 CFR 50 Appendix A Criterion 46)
- Seismic Effects (10 CFR 50 Appendix S and 10 CFR 100 & Appendix A)

The considerations for application of these special requirements to motor-operated valves, as identified in Generic Letters 89-10 and 96-05, are also within the scope of these processes and attributes.

Table 2 is a list of components that when located in safety systems are typically required to meet the special treatment requirements.

Since these processes and attributes are regulated by the NRC, it is assumed that they are met by all nuclear power plants.

2.3 Regulatory Requirements

The column "Regulatory Requirements" identifies the specific special treatment rules and documents that relate to each of the processes and attributes identified in 2.2 above.

2.4 Commercial Processes and Standards Followed

The column "Commercial Processes and Standards Followed" identifies the industry standards and plant procedures/processes used by the plant that relate to each of the attributes.

2.5 Differences Between Nuclear and Commercial Processes and Standards

This column identifies the significant differences between how the attribute is met by the nuclear and the non-nuclear industries for similar conditions. Conditions includes events, such as earthquakes or accident environments, for which there must be reasonable assurance that the SSCs will continue to perform their intended function. Depending upon the type of non-nuclear facility being visited, differences will be between nuclear safety systems and BOP or between nuclear safety systems and fossil-fueled commercial electrical generating plants. In some cases the comparison may be between nuclear BOP and fossil-fueled commercial electrical generating plants.

3. Facility Visit Data Collection Strategy

As stated above, Table 1 has been developed to assist in comparing regulatory attributes required for nuclear safety related systems to non-nuclear practices. This table will be provided to the facilities being visited prior to the actual visit to allow sufficient time for the facility staff to assemble any information that might be useful to the NRC/INEEL during the visit.

NRC/INEEL will be trying to gather information from non-nuclear standards, company procedures, procurement specifications, practices, etc. that pertain to the various attributes. To the extent CCI can assist us in completing the table and/or provide us with copies of such documents upon arrival it would facilitate our information gathering efforts and would be greatly appreciated. It would also allow the visit to focus on those areas that need further discussion. Documents that are considered proprietary or are restricted to plant personnel use will be treated accordingly and will be either destroyed or returned when they are no longer needed by the project.

Table 1 Protocol For Facility Visits

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
1 Documentation			
a Maintain sufficient records	IWA 6000 50.49 (j) GDC 1 RG 1.89 IEEE 323 Part 50 App B		
b Type of records to be retained	NCA-1000, 3000 NB-3000 NB/NC/ND-4000, 5000, 7000, App V IST A, B & C OM-App I 50.49 (j) GDC 1 RG 1.89 IEEE 323 Part 50 App B		
c Inspection records requirements	NB-2000 IWA 4000, 6000 IST A Part 50 App B		
d Records shall be identifiable and retrievable	IWA 6000 IST A 50.49 (j) RG 1.89 IEEE 323 Part 50 App B		
e Record retention requirements	IWA 6000 IST A, B & C, OM-App I Part 50 App B RG 1.28		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	- Differences Between Nuclear and Commercial Processes and Standards - Differences Between Nuclear and Balance of Plant Processes and Standards - Differences Between Balance of Plant and Commercial Processes and Standards
f Documented IP&D	Part 50 App B		
g Activities accomplished in accordance with IP&D	IWA 4000 OM-App I Part 50 App B		
h Acceptance criteria included in IP&D	OM-App I GL 89-10 d. Part 50 App B		
i IP&D issuance & revision control	Part 50 App B		
j Document approval	Part 50 App B		
k IP&D distribution & location	Part 50 App B		
l IP&D change, review, & approval	Part 50 App B		
m Maintain Current SSC Setup Requirements	50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
2 QA			
a Implement Quality Assurance Program	NCA-4000, 8000 IST A RG 1.54, 1.116 GDC 1 Part 50 App B		
b Documented IP&Ds	Part 50 App B		
c Coverage for life	IST A Part 50 App B		
d Identification (list) of covered SSCs	IST A, B & C Part 50 App B		
e Organizations involved identified	Part 50 App B		
f Program with graded approach	IWA 4000 Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
g Activities accomplished under controlled conditions	Part 50 App B		
h Special controls, processes, etc	Part 50 App B		
i Personnel training/qualification	NCA-3000 IST A, OM-App I		
j Management reviews	Part 50 App B Part 50 App B		
k Planned and periodic audits	NCA-3000 IST A Part 50 App B RG 1.28		
l Audit performance	IST A Part 50 App B		
m Documentation & review of audit results	IST A Part 50 App B		
n Follow-up action	Part 50 App B		
o QA Organization	Part 50 App B		
3 Procedures			
a Describe activities affecting quality	Part 50 App B		
b Require procedural control	Part 50 App B		
c Include acceptance criteria	OM-App I GL 89-10 d. Part 50 App B		
d Ensure prerequisites are met	Part 50 App B		
e Include quality hold points	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
4 Testing/Inspection/ Examination²			
a Identify T/I/E program scope	NCA-5000 IWA 2000 RG 1.65 IST A, B & C, OM-App I GL 89-10 c. Part 50 App B		
b Develop T/I/E program	IWA 2000 IST A, B & C, OM-App I & II GL 89-10 c. 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B GDC 1		
c Qualified T/I/E personnel	NB/NC/ND-5000 IWA 2000 IST A, OM-App I Part 50 App B RG 1.58		
d T/I/E methods identified	NB/NC/ND-2000 IWA 2000 IST B & C, OM-App I & II GL 89-10 c. & f. Part 50 App B GDC 45 & 46		
e Inspectors perform independent assessments	IWA 2000 IST A, OM-App I Part 50 App B		
f Tests performed IAW procedures	IST A & B, OM-App I Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	- Differences Between Nuclear and Commercial Processes and Standards - Differences Between Nuclear and Balance of Plant Processes and Standards - Differences Between Balance of Plant and Commercial Processes and Standards
g Verify each operation where quality is necessary	Part 50 App B		
h Control of test equipment	NCA-3000 NB/NC/ND-6000 IST B & C, OM-App I Part 50 App B		
i Verify proper installation	IST B & C, OM-App I Part 50 App B		
j Verify specified characteristics are maintained	IST B, OM-App II Part 50 App B		
k Preoperational/ preservice tests	IST B & C, OM-App I Part 50 App B		
l Pressure tests	NB/NC/ND-3000, 6000 IWA 5000 IST C Part 50 App B GDC 45 & 46		
m Operational/ Inservice tests	RG 1.12, 1.14, 1.52 IST A, B & C OM-App I & II Part 50 App B 50.55a(b)(3)(ii) [GL 96-05]		
n Design-basis tests	NB/NC/ND-2000, 5000 GL 89-10 c. Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
o Post maintenance tests	IST B & C, OM-App I GL 89-10 f. Part 50 App B		
p Document & evaluate test results	IST B & C OM-App I & II GL 89-10 c. 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
q Acceptance criteria	Section III App VI, NB/NC/ND-5000 IWA 3000 IST B & C, OM-App I 50.55a(b)(3)(ii) [GL 96-05] GL 89-10 c. Part 50 App B		
r Flaw characterization	IWA 3000 Part 50 App B		
s Evaluate retest frequencies	IST B & C OM-App I & II Part 50 App B		
t T/I/E frequencies identified	IST A, B & C, OM-App I & II		
u T/I/E parameters identified	IST A, B & C, OM-App I		
v Corrective action	IST B & C, OM-App I 50.55a(b)(3)(ii) [GL 96-05]		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
5 Design Requirements			
a. Design specification	NCA-3000, App XXIII IWA 4000 GDC 1 Part 50 App B		
b. Performance requirements	NB/NC/ND-7000 RG 1.45, 1.52, 1.148, 1.14, 1.12 Part 50 App B		
c. Normal operating conditions	NB/NC/ND-3000 GDC 2 & 4		
d. Accident conditions	NB/NC/ND-3000 GDC 2 & 4		
e. Natural phenomena	NB/NC/ND-3000 GDC 2 Part 50 App S RG 1.29 100.23(d) Part 100 App A		
f. Seismic input spectra	Part 50 App S RG1.60, 1.122 100.23(c) 100.23(d) Part 100 App A		
g. Loads	NCA-2000 NB/NC/ND-3000 Part 50 App S Part 100 App A		
h. Acceptance criteria	NB/NC/ND-3000 Part 50 App B		
i. Standards	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
j Inspection and test capability	NB/NC/ND-3000, 7000 IST A, B & C GDC 45 & 46		
k Operating Limits	IST B		
6 Analysis			
a Personnel qualification	OM-App I Sect. III APP XXIII Part 50 App B		
b Checking and independent verification	Part 50 App B		
c Safety Assurance	NB/NC/ND-3000 Part 50 App B Part 50 App S		
d Functionality Assurance	RG 1.89 IEEE 323 Part 50 App B Part 50 App S Part 100 App A		
e Type of analysis	NB-3000, APP II OM-App II Part 50 App S RG 1.60, 1.61, 1.92 Part 100 App A		
f Acceptance criteria	NB/NC/ND-3000 IST B & C Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	- Differences Between Nuclear and Commercial Processes and Standards - Differences Between Nuclear and Balance of Plant Processes and Standards - Differences Between Balance of Plant and Commercial Processes and Standards
7 Design Verification			
a List of covered equip	50.49 (d) RG 1.89, App E IEEE 323 Part 50 App B		
b Environmental conditions	NB/NC/ND-3000 50.49 (e) GDC 4 RG 1.52; 1.89 IEEE 323 Part 50 App B		
c Dynamic effects	NB/NC/ND-3000 GDC 4 RG 1.45;1.89 IEEE 323 Part 50 App B Part 50 App S Part 100 App A		
d Natural Phenomena	NB/NC/ND-3000 GDC 2 Part 50 App B Part 100 App A RG 1.100 IEEE 344		
e Test procedures/ plan/profiles	RG 1.100; 1.89 C.2.a, C.3; IEEE 323 Part 50 App B Part 100 App A IEEE 344		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
f Test identical under identical conditions Or	NB/NC/ND-7000 GL 89-10 c. 50.49 (f)(1) RG 1.89; 1.100 IEEE 323 Part 50 App B Part 100 App A IEEE 344		
g Test identical equipment under similar conditions Or	GL 89-10 c. 50.49 (f)(1) RG 1.89; 1.100 IEEE 323 Part 50 App B Part 100 App A IEEE 344		
h Test similar equipment with supporting analysis Or	GL 89-10 f. 50.49 (f)(2) RG 1.89; 1.100 IEEE 323 Part 50 App B Part 100 App A IEEE 344		
i Verify by experience with supporting analysis Or	GL 89-10 f. 50.49 (f)(3) RG 1.89; 1.100 IEEE 323 Part 50 App B Part 100 App A IEEE 344		
j Verify using analysis Or	50.49 (f)(4) RG 1.89; 1.100 IEEE 323 Part 50 App B Part 100 App A IEEE 344		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
k Continuing qualification	50.55a(b)(3)(ii) [GL 96-05] RG 1.89 IEEE 323 Part 50 App B		
l Modifications during qualification	RG 1.89 IEEE 323 Part 50 App B		
8 Design Control			
a Regulatory requirements and design bases in I&Ds	Part 50 App B III		
b Quality standards specified	GDC 1 Part 50 App B		
c Applicability of materials, parts, equipment, and processes assured	Part 50 App B		
d Design interfaces and coordination ensured	Part 50 App B		
e Design verification	GL 89-10 c. GDC 1 Part 50 App		
f Verification independence	Part 50 App B		
g Prototype testing conditions	Part 50 App B		
h Design control applicability	Part 50 App B		
i Design change control	Part 50 App B		
j Personnel qualification	Part 50 App B		
k Software qualification	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
9 Procurement Initiation			
a Approved specification	Part 50 App B		
b Specifies qualified equipment	Part 50 App B		
c Vendor Qualification	Part 50 App B		
d Reference design and regulatory bases	Part 50 App B		
e Contractors/vendors App B program	Part 50 App B		
f Equipment/material/ services compliance with specifications	Part 50 App B		
g Source evaluation and selection	Part 50 App B		
h Evidence of quality furnished	Part 50 App B		
10 Manufacturing			
a Inspection points/procedures	Part 50 App B		
b Material control and certification	NCA-3000 Part 50 App B		
c Standards	NB/NC/ND-3000 GDC 1 Part 50 App B		
d Personnel qualification	NB/NC/ND-4000 Part 50 App B		
e Permitted materials	NCA-1000 NB/NC/ND-2000; RG 1.36, 1.65, 1.14, 1.31 Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
f Material processes	NB/NC/ND-2000, 4000; RG 1.44 Part 50 App B		
g Welding and joining	NCA-3000 NB/NC/ND-4000; RG 1.34, 1.43 Part 50 App B		
h Configuration	NB/NC/ND-3000, 4000, App XI Part 50 App B		
i Alignment and tolerances	NB/NC/ND-4000 Part 50 App B		
j Repair requirements	NB/NC/ND-2000 Part 50 App B		
k Properly marked	NCA-8000, 3000 NB/NC/ND-3000, 4000, 7000 Part 50 App B		
l Periodic QC assessment	Part 50 App B		
m Property control measures	Part 50 App B		
n Nonconforming items	NCA-3000 Part 50 App B		
o Acceptance testing	IST B & C		
11 Shipping/Storage/ Handling			
a Control S/S/H	Part 50 App B RG 1.38		
b S/S/H per procedures	Part 50 App B		
c Special protective environments	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
d Lockout/tagout	Part 50 App B		
e Identification and control of material, parts, and components	Part 50 App B		
f Maintain traceability	Part 50 App B		
g Measures designed to prevent use of incorrect or defective material, parts, or components	Part 50 App B		
h Maintain components and equipment in qualified condition	Part 50 App B		
i Parts inventory control	Part 50 App B		
j Consumable control	Part 50 App B		
12 Receipt Inspection			
a Documentation included	Part 50 App B		
b Inspection at manufacturers facility	Part 50 App B		
c Receipt examination	OM-App I Part 50 App B		
d Procurement requirements on site before installation	Part 50 App B		
e Specification requirements retained at plant site	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
13 Installation			
a Standards (industry, quality)	GDC 1 Part 50 App B		
b Qualification of procedures and personnel	Part 50 App B		
c Welding and joining	NCA-3000 NB/NC/ND-4000 RG 1.34, 1.43 Part 50 App B		
d Alignment and tolerances	NB/NC/ND-4000 Part 50 App B		
e Configuration	NB/NC/ND-3000, 4000, App XI RG 1.12		
14 Monitoring			
a Maintain SSC performance requirements	IST B & C 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
b Determine SSC performance degradations	IST B & C OM-App II 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
c Identify & correct conditions adverse to operability	IST C 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
d Determine/correct root cause to prevent reoccurrence	IST C, OM-App II 50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		
e Document root cause & report to management	50.55a(b)(3)(ii) [GL 96-05] Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
f Feedback into corrective action	50.55a(b)(3)(ii) [GL 96-05]		
15 Repair/Replacement / Modification			
a Stock Rotation	IWA 4000 Part 50 App B		
b Mechanical clamping devices requirements	IWA 4000 Part 50 App B		
c Stamping requirements	IWA 4000 Part 50 App B		
d Verification, inspection documentation	IWA 4000 Part 50 App B		
e Material substitution	IWA 4000 Part 50 App B		
f Failure/ flaw evaluations and corrective actions	Part 50 App B		
g Examination and testing	IWA 4000 IST B & C Part 50 App B		
h Welding, brazing, metal removal, and installation	IWA 4000 Part 50 App B		
i Heat exchanger tubing requirements, plugging, repair, sleeving, replacement	IWA 4000 Part 50 App B		
j Maintain qualified configuration	Part 50 App B		
k Use qualified components	50.49 (k)(1) RG 1.89 Part 50 App B		
l Modifications	Part 50 App B		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
m Inspection agency	IWA 4000		
16 Maintenance			
a Maintain specified characteristics	IST B & C 50.55a(b)(3)(ii). [GL 96-05] RG 1.33, 1.12, 1.52 Part 50 App B		
b Replacement equipment must be fully qualified	50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
17 Trending			
a Develop Trending program	OM-App II 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
b Gather SSC performance data	IST B & C OM-App II 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
c Analyze SSC performance trends	OM-App II 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
d Develop trend report	50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
e Feedback and implementation of trending results	50.55a(b)(3)(ii). [GL 96-05]		

Regulatory (Nuclear) Special Treatment Processes and Attributes	Regulatory Requirements	Commercial Processes and Standards Followed	• Differences Between Nuclear and Commercial Processes and Standards • Differences Between Nuclear and Balance of Plant Processes and Standards • Differences Between Balance of Plant and Commercial Processes and Standards
18 Corrective Actions			
a Develop corrective action program	50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
b Obtain input from testing in operation, inspection, examination maintenance, monitoring and trending	IST B & C, OM-App II 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
c Implement actions to address input	50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
d Document performance and completion of actions	IST B & C, OM-App I 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
e Control backlog of actions	50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		
f Incorporate results into plant programs	OM-App II 50.55a(b)(3)(ii). [GL 96-05] Part 50 App B		

Table 2 Safety System Components That Meet Special Treatment Requirements

Mechanical:

Centrifugal pumps (both vertical, horizontal, deep draft)
Positive displacement pumps
Valves (globe, gate, butterfly, check, relief, safety, etc.)
Valve operators (motor, air, hydraulic, etc.)
Solenoid operated valves
Piping (ASME Sec. III, Class 1 and Class 2; ANSI B31.7, ANSI B31.1, etc.)
Pressure vessels (ASME Sec VIII)
Containment penetrations (piping, electrical, I&C)
Tanks
Heat exchangers, room coolers
Pipe supports (springs, constant force supports, snubbers, stanchions, etc.)
Vessel/tank supports
Gaskets
Air compressors
HVAC
Rupture disks
Ion exchangers (or other types of water purifiers)
Bolts (flanged piping connections)
Anchor bolts (e.g., concrete anchors)

Electrical:

Lighting
Alarms
Electrical switchgear
Molded case circuit breakers
Transformers
Load centers
Motor control centers
Electrical cabling
Motor-generator units
Diesel generators
Batteries
Battery chargers
Inverters

I&C:

Process instrumentation (e.g., pressure transducers, thermocouples, etc.)